

# **Sustainability thoughts 152: How to highlight the four market structures that dominant component markets can have in terms of equality and freedom variability when under externality neutrality assumptions and without them?**

**By**

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## **Abstract**

When we link dominant component based theory under externality neutrality assumptions and under no externality neutrality assumptions with perfect market variability theory we can identify the four structures each perfect market can have in terms of equality and freedom, namely the fully unsustainable market structure, the dictatorship based market structure, the liberalism based market structure, and the true perfect market structure. And this raises the question: How to highlight the four market structures that all dominant component markets can have in terms of equality and freedom variability when under externality neutrality assumptions and without them? Among the goals of this paper is to provide a detailed answer to the question above.

## **Key concepts**

Perfect markets, perfect market variability, true perfect market, true imperfect market, fully unsustainable market, dictatorship based markets, liberalism based markets, true imperfect markets type 1, true imperfect markets type 2, market equality, market freedom, Adam Smith's perfect market, Karl Marx's red socialism market, market structure.

## **Introduction**

### **a) Dominant component based thinking under externality neutrality assumptions**

It has been highlighted that traditional market thinking under externality neutrality assumptions is based on the idea that a dominant market component drives economic activity

without producing externalities as under externality neutrality assumptions a market M can expand for ever (Muñoz 2021a), a situation that can be summarized in the following model:

### 1) $M = X$

Expression 1) above simply says that the dominant component X drives the market activity of perfect market M. For example, i) if the perfect market M in question is the perfect traditional market of Adam Smith (Smith 1776), then M would be the traditional market (TM) and since traditional market thinking is based on a dominant economy (B) as the driver X so that  $TM = B$ : And this means that economic growth (B) drives traditional market growth (TM) without producing externalities, social and/or environmental; and ii) if the perfect market M in question is the perfect red socialism market à la Karl Marx (Marx and Engels 1848), then M would be the red socialism market (KM); and since red socialism market thinking is based on a dominant society (A) as the driver X so that  $KM = A$ : And this means that social growth (A) drives red socialism market growth (KM) without producing externalities, economic and/or environmental.

### b) Dominant component variability based on equality and freedom

The perfect market M in expression 1) above has 4 different market structures when placed under dominant component equality ( $X_E$ ) and dominant component freedom ( $X_F$ ) considerations, as indicated below;

### 2) $M_j = X_E + X_F$

Expression 2) above indicates market  $M_j$  variability depends on whether or not there is only dominant component equality ( $X_E$ ) or there is only dominant component freedom ( $X_F$ ) or there is both dominant component equality and freedom ( $X_{EF}$ ) at same time or there is not dominant component equality and freedom at the same time, a situation described in detail case by case below.

#### *i) The case when $j = 0$ as there is no component equality and there is no component freedom at the same time*

When there is no dominant component equality ( $X_e$ ) and dominant component freedom  $X_f$  at the same time, then we have a fully unsustainable market  $M_0$  as indicated below:

### 3) $M_0 = X_e X_f = X_{ef} = \mathbf{A \text{ fully unsustainable market} = FUM} = \mathbf{x}$

Expression 3) shows the structure of a fully unsustainable market ( $FUM = x$ ), where there is no dominant component equality and freedom at the same time.

#### *ii) The case when $j = 1$ as there is only dominant component equality*

When there is only dominant component equality ( $X_E$ ) present, then we have a dictatorship based market (DM) as there is no dominant component freedom as shown below:

**4)  $M_1 = X_E X_F = X_{EF} = \text{A dictatorship based market} = \text{DM} = [X]$**

Expression 4) displays the structure of a dictatorship based market(DM = [X]), where there is no dominant component freedom.

*iii) The case when  $j = 2$  as there is only dominant component freedom*

When there is only dominant component freedom( $X_F$ ) present, then we have a liberalism based market(LM) as there is no dominant component equality as shown below:

**5)  $M_2 = X_e X_F = X_{eF} = \text{A liberalism based market} = \text{LM} = \{X\}$**

Expression 5) states the structure of a liberal market(LM = {X}), where there is no dominant component equality.

*iv) The case when  $j = 3$  as there is both dominant component equality and freedom at the same time*

When we have both, dominant component equality( $X_E$ ) and dominant component freedom( $X_F$ ) at the same time, then we have a true perfect market(TPM) as indicated below;

**6)  $M_3 = X_E X_F = X_{EF} = \text{A true perfect market} = \text{TPM} = X$**

Expression 6) above points out the structure of a true perfect market(TPM = X), where there is dominant component equality and freedom at the same time.

**c) Linking dominant component based thinking under externality neutrality assumptions and dominant component variability based on equality and freedom**

The variability of the dominant component X based market M in terms of equality and inequality considerations when under externality neutrality assumptions can be summarized as in Table 1 below:

**Table 1**

	$M_0$	$M_1$	$M_2$	$M_3$
$M = X$	x	[X]	{X}	X
	FUM	DM	LM	TPM

We can see that Table 1 above shows that the 4 market structures possible in terms of equality and freedom are: a) the fully unsustainable market  $FUM = x$ ; b) the dictatorship based market  $DM = [X]$ ; c) the liberalism based market  $LM = \{X\}$ ; and d) the true perfect market  $TMP = X$ .

It is important to mention here that it has been pointed out very recently (Muñoz 2021b) that perfect market thinking under equality and freedom variability can be used to identify the structure of perfect true markets; and this understanding can help appreciate the true nature of some well-known markets like the perfect traditional market of Adam Smith or the red socialism market of Karl Marx. For example, a) it turns out to be that the perfect traditional market of Adam Smith is not a true perfect economy market it is based on economic freedom without equality; and hence it is actually a liberal economy based market; and the red socialism market of Karl Marx is not a true perfect social market as it is based on social equality without freedom; and therefore, it is a dictatorship based social market.

### **Generalizing the dominant component perfect market variability model based on equality and freedom under externality neutrality assumptions**

We can generalize the information in Table 1 above to reflect the structure of all possible dominant component markets and find the respective 4 structures for each market in terms of equality and freedom generated by  $M_{ij}$  if we make  $M = M_i$  and  $X = X_i$  and substitute this in information in Table 1 above to obtain the generalization shown in Table 2 below:

**Table 2**

	$M_0$	$M_1$	$M_2$	$M_3$
$M_i = X_i$	$x_i$	$[X_i]$	$\{X_i\}$	$X_i$
	$FUM_i$	$DM_i$	$LM_i$	$TPM_i$

We can see that Table 2 above provides that the 4 market structures possible in terms of equality and freedom for all markets  $M_i = X_i$  are: a) the fully unsustainable market  $FUM_i = x_i$ ; b) the dictatorship based market  $DM_i = [X_i]$ ; c) the liberalism based market  $LM_i = \{X_i\}$ ; and d) the true perfect market  $TPM_i = X_i$ .

Therefore, if we know the nature or form of the driving dominant component  $X_i$  of market  $M_i$ , we can determine its 4 market structures in terms of equality and freedom. How market  $M_i$  variability when dealing with social, economic and environmental components can be framed has been recently point out, both in terms of dominant component under externality neutrality assumptions (Muñoz 2021c) and in terms of dominant components under no externality neutrality assumptions (Muñoz 2021d).

### **The need to understand the nature of the 4 market structures that all possible forms of markets have**

Notice that the dominant component  $X_i$  could single component dominant like in the perfect traditional market where only the economy matters or it could be a group component dominant like the green markets where both the environment and the economy matter. For example, if we have a market  $M_4 = X_4 = EN = C$  = the perfect environmental market, a single dominant component market, then we can now find the 4 market structures associated with this dominant environmental component market based on the structures in Table 2 above: its fully unsustainable market structure  $FUM_4 = c$  when there is no environmental equality and no environmental freedom at the same time; its dictatorship base market structure  $DM_4 = [C]$  when there is only environmental equality but not freedom; its liberal market structure  $LM_4 = \{C\}$  when there is only environmental freedom but no equality; and its true perfect market structure  $TPM_4 = C$  when there is environmental equality and environmental freedom at the same time. Therefore, if we know the type of dominant market structure  $M_i = X_i$  has we can find its 4 possible market structures in terms of equality and freedom associated with that specific type of market, which raises the question: How to highlight the four market structures that all dominant component markets can have in terms of equality and freedom variability when under externality neutrality assumptions and without them? Among the goals of this paper is to provide a detailed answer to the question above.

### **Objectives**

1) To introduced a general perfect market model variability in a system with social, economic, and environmental components; 2) To highlight perfect market type, perfect market structure, and perfect market name under externality neutrality assumptions; 3) To highlight the four markets structures in terms of equality and freedom that each possible perfect market has, the fully unsustainable structure, the dictatorship based structure, the liberal based structure, and the true perfect market structure, while under externality neutrality assumptions; 4) To highlight perfect market type, perfect market structure, and perfect market name under NO externality neutrality assumptions; and 5) To highlight the four markets structures in terms of equality and freedom that each possible perfect market has, the fully unsustainable structure, the dictatorship

based structure, the liberal based structure, and the true perfect market structure, while under NO externality neutrality assumptions

## Methodology

a) The terminology used in this paper is shared; b) Some operational concepts are given; c) A general perfect market model variability model in a system with social, economic, and environmental components is introduced; d) The perfect market type, perfect market structure, and perfect markets name for each market under externality neutrality assumptions are pointed out; e) The four markets structures in terms of equality and freedom that each possible perfect market has, the fully unsustainable structure, the dictatorship based structure, the liberal based structure, and the true perfect market structure, while under externality neutrality assumptions are highlighted; f) The perfect market type, perfect market structure, and perfect market name for each market under NO externality neutrality assumptions are stressed; g) The four markets structures in terms of equality and freedom that each possible perfect market has, the fully unsustainable structure, the dictatorship based structure, the liberal based structure, and the true perfect market structure, while under NO externality neutrality assumptions are indicated; And h) Some food for thoughts and relevant conclusions are listed.

## Terminology

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X = Dominant component X	x = Passive component X
B = Dominant economy	b = Passive economy
A = Dominant society	a = Passive society
C = Dominant environment	c = Passive environment
M = Perfect market M	[M] = Imperfect market M
$M_i$ = Perfect market $M_i$	$[M_i]$ = Imperfect market $M_i$
[N] = Market N under authoritarianism	{N} = Market N under liberalism
TM = The perfect traditional market	PSM = The perfect social market
PECM = The perfect economy market	$M_j$ = Market type 'J'
PENM = The perfect environmental market	PGM = The perfect green market

PRM = The perfect red market                      PSENM = The perfect socio-environmental market  
 PS = The perfect sustainability market    [ M ] = Market M under equality, but not freedom  
 { M } = Market N under freedom, but not equality    M = Market under equality and freedom  
 FUM = Full unsustainability market      SGi = Sustainability gap “i”  
 TPM = The true perfect market                      TIM = The true imperfect market  
 FTIM = Fully true imperfect market              PEM = The perfect economy market  
 TIM<sub>1</sub> = The true imperfect market type 1    TIM<sub>2</sub> = The true imperfect market type 2  
 TPPEM = The true perfect economy market    TIEM = The true imperfect economy market  
 TPSM = The true perfect social market      TIEM<sub>1</sub> = True imperfect economy market type 1  
 TISM = The true imperfect social market    TIEM<sub>2</sub> = True imperfect economy market type 2  
 TISM<sub>1</sub> = True imperfect social market type 1    TISM<sub>2</sub> = True imperfect social market type 1  
 LM = Liberal market                                      DM = Dictatorship based market

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## **Operational concepts and types of perfect market structures**

### **a) Operational concepts**

- 1) Perfect market**, *a market where there is dominant component equality and freedom*
- 2) Imperfect market**, *a market where there is component equality, but not freedom*
- 3) Perfect paradigm shift**, *a shift from a perfect market to a higher level perfect market*
- 4) Paradigm management**, *the handling of cost externalization through externality management*
- 5) Paradigm flip**, *a flip to the inverse opposite paradigm*
- 6) Perfect paradigm flip**, *a flip to the perfect inverse opposite paradigm*
- 7) Imperfect paradigm flip**, *a flip to the imperfect inverse opposite paradigm*
- 8) Authoritarian market**, *an imperfect market*

**9) Sustainability market**, *the perfect market where there is full co-component equality and freedom*

**10) Externality management market**, *the market where there is partial co-component equality, but no freedom.*

**11) Imperfect paradigm shift**, *a shift from a perfect market to a higher level imperfect market*

## **b) Type of perfect market structures**

Given the dummy market models with two components  $M_1 = Xy$  and  $M_2 = xY$ , the following can be said about different market structures:

### **1) Perfect markets**

There is dominant component equality and freedom

**$M_1 = Xy = A$  dominant component X perfect market**

**$M_2 = xY = A$  dominant component Y perfect market**

**$M_3 = XY = A$  co-dominant component XY perfect market**

You can appreciate that when there is both component equality and freedom at the same time you have a true perfect market.

### **2) Imperfect markets type 1**

There is dominant component equality, but no freedom, they are dictatorship based markets

**$[M_1] = [X]y = A$  dominant component X imperfect market type 1**

**$[M_2] = x[Y] = A$  dominant component Y imperfect market type 1**

**$[M_3] = [XY] = A$  co-dominant component XY imperfect market type 1**

You can see that when there is only component equality you have an imperfect market type 1.

### **3) Imperfect markets type 2**

There is dominant component freedom, but no equality, they are liberalism based markets

**$\{M_1\} = \{X\}y = A$  dominant component X imperfect market type 2**

**$\{M_2\} = x\{Y\} = A$  dominant component Y imperfect market type 2**



### **{M<sub>3</sub>} = {XY} = A co-dominant component XY imperfect market type 2**

Notice that when there is only component freedom again you have an imperfect market type 2.

#### **c) Perfect markets and imperfect markets under sustainability gap pressures**

Notice that if we make the passive component “y” and passive component “x” the sustainability gap pressures(SG) affecting all those perfect and imperfect market structures described above so that  $SG_Y = y$  and  $SG_X = x$ , we can rewrite all those market structures above as when under binding sustainability gap pressures  $SG_Y$  and  $SG_X$ . For example, rewriting all market structures of Market  $M_1$  in terms of binding sustainability gaps we get the following structures:

##### **i) The perfect market M1 under binding sustainability gap pressures**

$$M_1 = Xy = X.SG_Y \text{ since } SG_Y = y$$

A dominant component X perfect market  $M_1$  under binding sustainability gap pressures  $SG_Y$ .

##### **ii) The imperfect market M1 type 1 under binding sustainability gap pressures**

$$[M_1] = [X]y = [X].SG_Y \text{ since } SG_Y = y$$

A dominant component X imperfect market  $M_1$  type 1 under binding sustainability gap pressures  $SG_Y$ .

##### **ii) The imperfect market M1 type 2 under binding sustainability gap pressures**

$$\{M_1\} = \{X\}y = \{X\}.SG_Y \text{ since } SG_Y = y$$

A dominant component X imperfect market  $M_1$  type 2 under binding sustainability gap pressures  $SG_Y$ .

### **The general dominant component market variability model under externality neutrality assumptions**

In a system with social(A), economic(B) and environmental(C) components the structures of all possible markets  $M_i$  can be stated as followed:

$$M_i = X_i = A + B + C$$

The expression above tells us that there can be a market  $M_i$  when only one component is in dominant form or when only two components are in dominant form or when all three

components are in dominant form or when all components are in passive form. The case of each of these possible markets is described in detail below:

***a) The case when all social, economic and environmental components are in passive form ( $i = 0$ )***

When there is no component dominance then social(a), economic(b), and environmental components(c) are in passive form, and then we have the case of market  $M_0$

$$M_0 = abc$$

Market  $M_0$  reflects the structure of a fully unsustainable market(FUM).

***b) The case when only the social component(A) is in dominant form ( $i = 1$ )***

When only the social component is dominant(A), then we have a society only relevant market, as indicated below:

$$M_1 = A$$

Market  $M_1$  reflects the structure of the perfect social market(PSM).

***c) The case when only the economic component(B) is in dominant form ( $i = 2$ )***

When only the economy component is dominant(B), then we have an economy only relevant market, as stated below:

$$M_2 = B$$

Market  $M_2$  reflects the structure of the perfect economy market(PEM).

***d) The case when only the environmental component(C) is in dominant form ( $i = 3$ )***

When only the environmental component is dominant(C), then we have an environment only relevant market, as indicated below:

$$M_3 = C$$

Market  $M_3$  reflects the structure of the perfect environmental market(PENM).

***e) The case when only the social and economic components(AB) are in dominant form ( $i = 4$ )***

When both the social(A) and economic(B) components are in dominant form, then we have a society and economy only relevant market, as indicated below:

$$M_4 = AB$$

Market  $M_4$  reflects the structure of the perfect red market(PRM).

*f) The case when only the economic and environmental components(BC) are in dominant form(i = 5)*

When both the economic(B) and environmental(C) components are in dominant form, then we have an environment and economy only relevant market, as indicated below:

**M<sub>5</sub> = BC**

Market M<sub>5</sub> reflects the structure of the perfect green market(PGM).

*g) The case when only the social and environmental components(AC) are in dominant form(i = 6)*

When both the social(A) and environmental(C) components are in dominant form, then we have a society and environment only relevant market, as indicated below:

**M<sub>6</sub> = AC**

Market M<sub>6</sub> reflects the structure of the perfect socio-environmental market(PSENM).

*h) The case when all social, economic and environmental components are in dominant form at the same time(i = 7)*

When we have all components, social(A), economic(B) and environmental(C) components are in dominant form at the same time, then we have a society, economy, and environment relevant market as indicated below:

**M<sub>7</sub> = ABC**

Market M<sub>7</sub> reflects the structure of the perfect sustainability market(PS).

**Arranging markets as one dominant component markets, two dominant component markets and three dominant component markets while indicating their market type**

All possible markets listed above are arranged here in terms of dominance as indicated below:

**Table 3**

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Type of	Market	Name of
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**Market                  Structure                  Market**

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**The fully unsustainable market**  
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**M<sub>0</sub>                  abc                  FUM = The fully unsustainable market**  
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**One dominant component based markets**  
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**M<sub>1</sub>                  A                  PSM = The perfect social market**  
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**M<sub>2</sub>                  B                  PEM = The perfect economy market**  
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**M<sub>3</sub>                  C                  PENM = The perfect environmental market**  
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**Two dominant component based markets**  
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**M<sub>4</sub>                  AB                  PRM = The perfect red market**  
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**M<sub>5</sub>                  BC                  PGM = The perfect green market**  
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**M<sub>6</sub>                  AC                  PSENM = The perfect socio-environmental market**  
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**Three dominant component based markets**  
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**M<sub>7</sub>                  ABC                  PS = The perfect sustainability market**

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The following aspects can be highlighted based on the information in Table 3 above: i) All one dominant component models and all two dominant component models can expand for ever as under externality neutrality assumptions there are no limits for their growth; ii) the fully unsustainable market  $M_0$  is a fully imperfect market; and iii) in the perfect sustainability market  $M_7$  there are no externalities so no externalities can be assumed away.

**Highlighting the 4 markets structures based on equality and freedom variability for each possible market in Table 3 above**

Following the structure of perfect market variability as indicated in Table 2 in the introduction and applying it to each market structure in Table 3 above we can find the four market structures in terms of equality and freedom associated with each of them as indicated below case by case.

*i) The case of the fully unsustainable market*

When we have a fully unsustainable market ( $M_0 = abc$ ) all its market structures in terms of equality and freedom have an unsustainable nature as indicated in Table 4 below:

**Table 4**

	$M_0$	$M_1$	$M_2$	$M_3$
$M_0 = X_0 = abc$	<b>abc</b>	<b>[abc]</b>	<b>{abc}</b>	<b>abc</b>
	<b>FUM<sub>0</sub></b>	<b>DM<sub>0</sub></b>	<b>LM<sub>0</sub></b>	<b>FTIM<sub>0</sub></b>

We can point out the following things based on Table 4 above: i) A fully unsustainable market  $M_0$  under no equality and freedom is a fully imperfect market  $FUM_0$  as in column 1; ii) A fully unsustainable market  $M_0$  under dictatorship is a fully unsustainability dictatorship market  $DM_0$  as in column 2; iii) A fully unsustainable market  $M_0$  under liberalism is a fully unsustainable liberal market  $LM_0$  as in column 3; and iv) A fully unsustainable market  $M_0$  under no equality and freedom is a full true imperfect market  $FTIM_0$  as in column 4.

*ii) The case of the perfect social market*

When we have a perfect social market  $M_1 = A$ , then its four market structures in terms of equality and freedom are as indicated in Table 5 below:

**Table 5**

	<b>M0</b>	<b>M1</b>	<b>M2</b>	<b>M3</b>
<b><math>M_1 = X_1 = A</math></b>	<b>a</b>	<b>[A]</b>	<b>{A}</b>	<b>A</b>
	<b>FUM<sub>1</sub></b>	<b>DM<sub>1</sub></b>	<b>LM<sub>1</sub></b>	<b>TPM<sub>1</sub></b>

We can appreciate from the information in Table 5 above that: i) the fully unsustainable form of the social market is when there is no social equality and freedom at the same time  $FUM_1 = a = m_1$ ; ii) the dictatorship form of the social market is when there is social equality, but no freedom  $DM_1 = [A] = [M_1]$ ; iii) the liberal form of the social market is when there is social freedom, but no equality  $LM_1 = \{A\} = \{M_1\}$ ; and iv) the true perfect market form of the social market is where there is both social equality and freedom at the same time  $TPM_1 = A = M_1$ .

Therefore, if a perfect social market means both the existence of social equality and freedom at the same time, then it is a true perfect market. If a perfect social market refers to the existence of only social equality, it is not a true perfect market, but it is a true imperfect market type 1 as dictatorship based markets are. On the other hand, if a perfect social market refers to the existence of only social freedom, it is not a true perfect market, but it is a true imperfect market type 2 as liberalism based markets are. Notice that since the red socialism model of Karl Marx works on social equality only, it is not a true perfect social market, but it is a true imperfect market type 1 as it is a social dictatorship based market.

***iii) The case of the perfect economy market***

When we have a perfect economy market  $M_2 = B$ , then its four market structures in terms of equality and freedom are as indicated in Table 6 below:

**Table 6**

	<b>M0</b>	<b>M1</b>	<b>M2</b>	<b>M3</b>
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$M_2 = X_2 = B$	<b>b</b>	<b>[B]</b>	<b>{B}</b>	<b>B</b>
	<b>FUM<sub>2</sub></b>	<b>DM<sub>2</sub></b>	<b>LM<sub>2</sub></b>	<b>TPM<sub>2</sub></b>

We can see from the information in Table 6 above that: i) the fully unsustainable form of the economic market is when there is no economic equality and freedom at the same time  $FUM_2 = b = m_2$ ; ii) the dictatorship form of the economic market is when there is economic equality, but no freedom  $DM_2 = [B] = [M_2]$ ; iii) the liberal form of the economic market is when there is economic freedom, but no equality  $LM_2 = \{B\} = \{M_2\}$ ; and iv) the true perfect market form of the economic market is where there is both economic equality and freedom at the same time  $TPM_2 = B = M_2$ .

Hence, if a perfect economy market means both the existence of economic equality and freedom at the same time, then it is a true perfect market. If a perfect economy market refers to the existence of only economic equality, it is not a true perfect market, but it is a true imperfect market type 1 as dictatorship based markets are. On the other hand, if a perfect economic market refers to the existence of only economic freedom, it is not a true perfect market, but it is a true imperfect market type 2 as liberalism based markets are. Notice that since the traditional perfect market of Adam Smith works on economic freedom only, it is not a true perfect economy market, but it is a true imperfect market type 2 as it is liberalism based market.

*iv) The case of the perfect environmental market*

When we have a perfect environmental market  $M_3 = C$ , then its four market structures in terms of equality and freedom are as indicated in Table 7 below:

**Table 7**

	<b>M<sub>0</sub></b>	<b>M<sub>1</sub></b>	<b>M<sub>2</sub></b>	<b>M<sub>3</sub></b>
$M_3 = X_3 = C$	<b>c</b>	<b>[C]</b>	<b>{C}</b>	<b>C</b>
	<b>FUM<sub>3</sub></b>	<b>DM<sub>3</sub></b>	<b>LM<sub>3</sub></b>	<b>TPM<sub>3</sub></b>

We can see from the information in Table 7 above that: i) the fully unsustainable form of the environmental market is when there is no environmental equality and freedom at the same

time  $FUM_3 = c = m_3$ ; ii) the dictatorship form of the environmental market is when there is environmental equality, but no freedom  $DM_3 = [C] = [M_3]$ ; iii) the liberal form of the environmental market is when there is environmental freedom, but no equality  $LM_3 = \{C\} = \{M_3\}$ ; and iv) the true perfect market form of the environmental market is where there is both environmental equality and freedom at the same time  $TPM_3 = C = M_3$ .

Therefore, if a perfect environmental market means both the existence of environmental equality and freedom at the same time, then it is a true perfect market. If a perfect environmental market refers to the existence of only environmental equality, it is not a true perfect market, but it is a true imperfect market type 1 as dictatorship based markets are. On the other hand, if a perfect environmental market refers to the existence of only environmental freedom, it is not a true perfect market, but it is a true imperfect market type 2 as liberalism based markets are.

**v) *The case of the perfect red market***

When we have a perfect red market  $M_4 = AB$ , then its four market structures in terms of equality and freedom are as indicated in Table 8 below:

**Table 8**

	$M_0$	$M_1$	$M_2$	$M_3$
$M_4 = X_4 = AB$	<b>ab</b>	<b>[AB]</b>	<b>{AB}</b>	<b>AB</b>
	<b>FUM<sub>4</sub></b>	<b>DM<sub>4</sub></b>	<b>LM<sub>4</sub></b>	<b>TPM<sub>4</sub></b>

We can see from the information in Table 8 above that: i) the fully unsustainable form of the red market is when there is no social and economic equality and freedom at the same time  $FUM_4 = ab = m_4$ ; ii) the dictatorship form of the red market is when there is socio-economic equality, but no freedom  $DM_4 = [AB] = [M_4]$ ; iii) the liberal form of the red market is when there is socio-economic freedom, but no equality  $LM_4 = \{AB\} = \{M_4\}$ ; and iv) the true perfect market form of the red market is where there is both socio-economic equality and freedom at the same time  $TPM_4 = AB = M_4$ .

Therefore, if a perfect red market means both the existence of socio-economic equality and freedom at the same time, then it is a true perfect market. If a perfect red market refers to the existence of only socio-economic equality, it is not a true perfect market, but it is a true imperfect market type 1 as dictatorship based markets are. On the other hand, if a perfect red



market refers to the existence of only socio-economic freedom, it is not a true perfect market, but it is a true imperfect market type 2 as liberalism based markets are.

**vi) The case of the perfect green market**

When we have a perfect green market  $M_5 = BC$ , then its four market structures in terms of equality and freedom are as indicated in Table 9 below:

**Table 9**

	$M_0$	$M_1$	$M_2$	$M_3$
$M_5 = X_5 = BC$	bc	[BC]	{BC}	BC
	FUM <sub>5</sub>	DM <sub>5</sub>	LM <sub>5</sub>	TPM <sub>5</sub>

We can see from the information in Table 9 above that: i) the fully unsustainable form of the green market is when there is no economic and environmental equality and freedom at the same time  $FUM_5 = bc = m_5$ ; ii) the dictatorship form of the green market is when there is eco-economic equality, but no freedom  $DM_5 = [BC] = [M_5]$ ; iii) the liberal form of the green market is when there is eco-economic freedom, but no equality  $LM_5 = \{BC\} = \{M_5\}$ ; and iv) the true perfect market form of the green market is where there is both eco-economic equality and freedom at the same time  $TPM_5 = BC = M_5$ .

Therefore, if a perfect green market means both the existence of eco-economic equality and freedom at the same time, then it is a true perfect market. If a perfect green market refers to the existence of only eco-economic equality, it is not a true perfect market, but it is a true imperfect market type 1 as dictatorship based markets are. On the other hand, if a perfect green market refers to the existence of only eco-economic freedom, it is not a true perfect market, but it is a true imperfect market type 2 as liberalism based markets are.

**vii) The case of the perfect socio-environmental market**

When we have a perfect socio-environmental market  $M_6 = AC$ , then its four market structures in terms of equality and freedom are as indicated in Table 10 below:

**Table 10**

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	$M_0$	$M_1$	$M_2$	$M_3$
$M_6 = X_6 = AC$	ac	[AC]	{AC}	AC
	<b>FUM<sub>6</sub></b>	<b>DM<sub>6</sub></b>	<b>LM<sub>6</sub></b>	<b>TPM<sub>6</sub></b>

We can see from the information in Table 10 above that: i) the fully unsustainable form of the socio-environmental market is when there is no social and environmental equality and freedom at the same time  $FUM_6 = ac = m_6$ ; ii) the dictatorship form of the socio-environmental market is when there is socio-environmental equality, but no freedom  $DM_6 = [AC] = [M_6]$ ; iii) the liberal form of the socio-environmental market is when there is socio-environmental freedom, but no equality  $LM_6 = \{AC\} = \{M_6\}$ ; and iv) the true perfect market form of the socio-environmental market is where there is both socio-environmental equality and freedom at the same time  $TPM_6 = AC = M_6$ .

Therefore, if a perfect socio-environmental market means both the existence of socio-environmental equality and freedom at the same time, then it is a true perfect market. If a perfect socio-environmental market refers to the existence of only socio-environmental equality, it is not a true perfect market, but it is a true imperfect market type 1 as dictatorship based markets are. On the other hand, if a perfect socio-environmental market refers to the existence of only socio-environmental freedom, it is not a true perfect market, but it is a true imperfect market type 2 as liberalism based markets are.

*viii) The case of the perfect sustainability market*

When we have a perfect sustainability market  $M_7 = ABC$ , then its four market structures in terms of equality and freedom are as indicated in Table 11 below:

**Table 11**

	$M_0$	$M_1$	$M_2$	$M_3$
$M_7 = X_7 = ABC$	abc	[ABC]	{ABC}	ABC
	<b>FUM<sub>7</sub></b>	<b>DM<sub>7</sub></b>	<b>LM<sub>7</sub></b>	<b>TPM<sub>7</sub></b>

We can appreciate from the information in Table 11 above that: i) the fully unsustainable form of the sustainability market is when there is no social, economic, and environmental equality and freedom at the same time  $FUM_7 = abc = m_7$ ; ii) the dictatorship form of the sustainability market is when there is socio-economic-environmental equality, but no freedom  $DM_7 = [ABC] = [M_7]$ ; iii) the liberal form of the sustainability market is when there is socio-economic-environmental freedom, but no equality  $LM_7 = \{ABC\} = \{M_7\}$ ; and iv) the true perfect market form of the sustainability market is where there is social, economic and environmental equality and freedom at the same time  $TPM_7 = ABC = M_7$ .

Therefore, if a perfect sustainability market means both the existence of socio-economic-environmental equality and freedom at the same time, then it is a true perfect market. If a perfect sustainability market refers to the existence of only socio-economic-environmental equality, it is not a true perfect market, but it is a true imperfect market type 1 as dictatorship based markets are. On the other hand, if a perfect sustainability market refers to the existence of only socio-economic-environmental freedom, it is not a true perfect market, but it is a true imperfect market type 2 as liberalism based markets are.

**Summarizing the four market structure of all possible perfect markets in terms of equality and freedom under externality neutrality assumptions**

All dominant component markets above together with their variability in terms of equality and freedom can be appreciated in one place as shown below:

**Table 12**

	$M_0$	$M_1$	$M_2$	$M_3$
$M_i = X_i$	$x_i$	$[X_i]$	$\{X_i\}$	$X_i$
$M_0 = X_0 = abc$	$abc$	$[abc]$	$\{abc\}$	$abc$
$M_1 = X_1 = A$	$a$	$[A]$	$\{A\}$	$A$
$M_2 = X_2 = B$	$b$	$[B]$	$\{B\}$	$B$

$M_3 = X_3 = C$	<b>c</b>	<b>[C]</b>	<b>{C}</b>	<b>C</b>
$M_4 = X_4 = AB$	<b>ab</b>	<b>[AB]</b>	<b>{AB}</b>	<b>AB</b>
$M_5 = X_5 = BC$	<b>bc</b>	<b>[BC]</b>	<b>{BC}</b>	<b>BC</b>
$M_6 = X_6 = AC$	<b>ac</b>	<b>[AC]</b>	<b>{AC}</b>	<b>AC</b>
$M_7 = X_7 = ABC$	<b>abc</b>	<b>[ABC]</b>	<b>{ABC}</b>	<b>ABC</b>
	<b>FUM</b>	<b>DM</b>	<b>LM</b>	<b>TPM</b>

Table 12 above helps us see per row left to right the four market structures that each market has in terms of equality and freedom; and it helps also to see per column the fully unsustainable form(FUM) of each market, the dictatorship based form(DM) of each market, the liberal market form(LM) of each market, and the true perfect market form(TPM) of each market.

### Expressing dominant market variability under NO externality neutrality assumptions

When there are no externality neutrality assumptions then the externality pressures under which each dominant component paradigm works need to be represented by adding the missing externality pressures to the information on Table 3 above in a system where there are social, economic and environmental components in order to we generate the structure of each model has under related externality pressures as indicated below:

**Table 13**

Type of Market	Market Structure	Name of Market

<b>M<sub>0</sub></b>	<b>abc</b>	<b>FUM = The fully unsustainable market</b>
-----		
<b>M<sub>1</sub></b>	<b>Abc</b>	<b>PSM = The perfect social market</b>
-----		
<b>M<sub>2</sub></b>	<b>aBc</b>	<b>PEM = The perfect economy market</b>
-----		
<b>M<sub>3</sub></b>	<b>abC</b>	<b>PENM = The perfect environmental market</b>
-----		
<b>M<sub>4</sub></b>	<b>ABc</b>	<b>PRM = The perfect red market</b>
-----		
<b>M<sub>5</sub></b>	<b>aBC</b>	<b>PGM = The perfect green market</b>
-----		
<b>M<sub>6</sub></b>	<b>AbC</b>	<b>PSENM = The perfect socio-environmental market</b>
-----		
<b>M<sub>7</sub></b>	<b>ABC</b>	<b>PS = The perfect sustainability market</b>
-----		

Notice that when adding the externality pressures to each dominant component market we are placing limits to their growth. For example, model M<sub>2</sub> = the perfect economy market has now two externality pressures it did not have under externality neutrality assumptions limiting economy growth, social(a) and environmental(c) pressures. And notice too that the perfect sustainability market M<sub>7</sub> has no externality pressures.

**Summarizing the four market structure in terms of equality and freedom of all possible perfect markets under NO externality neutrality assumptions**

By adding the externality pressures under which each model in Table 12 operates when under no externality neutrality assumptions we can generate the information below:

**Table 14**

	<b>M<sub>0</sub></b>	<b>M<sub>1</sub></b>	<b>M<sub>2</sub></b>	<b>M<sub>3</sub></b>
<b>M<sub>i</sub> = X<sub>i</sub></b>	<b>x<sub>i</sub></b>	<b>[X<sub>i</sub>]</b>	<b>{X<sub>i</sub>}</b>	<b>X<sub>i</sub></b>
<b>M<sub>0</sub> = X<sub>0</sub> = abc</b>	<b>abc</b>	<b>[abc]</b>	<b>{abc}</b>	<b>abc</b>
<b>M<sub>1</sub> = X<sub>1</sub> = Abc</b>	<b>abc</b>	<b>[Abc]</b>	<b>{Abc}</b>	<b>Abc</b>
<b>M<sub>2</sub> = X<sub>2</sub> = aBc</b>	<b>abc</b>	<b>[aBc]</b>	<b>{aBc}</b>	<b>aBc</b>
<b>M<sub>3</sub> = X<sub>3</sub> = abC</b>	<b>abc</b>	<b>[abC]</b>	<b>{abC}</b>	<b>abC</b>
<b>M<sub>4</sub> = X<sub>4</sub> = ABc</b>	<b>abc</b>	<b>[ABc]</b>	<b>{ABc}</b>	<b>ABc</b>
<b>M<sub>5</sub> = X<sub>5</sub> = aBC</b>	<b>abc</b>	<b>[aBC]</b>	<b>{aBC}</b>	<b>aBC</b>
<b>M<sub>6</sub> = X<sub>6</sub> = AbC</b>	<b>abc</b>	<b>[AbC]</b>	<b>{AbC}</b>	<b>AbC</b>
<b>M<sub>7</sub> = X<sub>7</sub> = ABC</b>	<b>abc</b>	<b>[ABC]</b>	<b>{ABC}</b>	<b>ABC</b>
	<b>FUM</b>	<b>DM</b>	<b>LM</b>	<b>TPM</b>

We can appreciate based on the information in Table 14 the following as compared to the information in Table 12 above: i) adding the specific externality pressures under which each dominant component model operates leads to limits to growth for all one component dominant and all two component dominant models from M<sub>1</sub> to M<sub>6</sub>; ii) adding the specific externality pressures under which each dictatorship market and each liberal market from M<sub>1</sub> to M<sub>6</sub> works

places limits to growth in those markets; ii) adding the specific externality pressures under which each true perfect markets from  $M_1$  to  $M_6$  operates affects previously thought perfect market structures as it brings unsuitability to their growth; and iv) The structure of the perfect sustainability market  $M_7$  and the structure of its fully unsustainable form, of its dictatorship based form, of its liberal market form; and of its true perfect market form is the same, whether under externality neutrality assumptions or not as it can be seen in Table 12 and Table 14.

### **Food for thoughts**

a) Is a liberal red market a true perfect red market? I think No, what do you think?; b) Is a dictatorship based green market a true perfect green market? I think No, what do you think?; and c) Is the existence of socio-environmental equality and freedom at the same time the necessary and sufficient condition for the existence of true perfect socio-environmental markets? I think Yes, what do you think?

### **Conclusions**

i) It was shown that the dominant component variability model  $M_i = A + B + C$  can be used to determine all possible markets under externality neutrality assumptions in a system with social(A), economic(B), and environmental(C) components; ii) It was demonstrated how for each dominant component markets we can find the four markets structures consistent with it in terms of dominant component equality and freedom; iii) It was indicated based on dictatorship market structures and liberal market structures that the red socialism market of Karl Marx is not a true perfect social market, but a true imperfect market type 1; and it also was stressed that the perfect traditional market of Adam Smith is not a true perfect economy market, but a true imperfect market type 2; iv) It was mentioned that under externality neutrality assumptions markets have no limits to growth; v) It was pointed out that if we add the externality pressures to one and two dominant component markets and their associated market structures based on equality and freedom under which each of them operates then we are placing limits on their growth; and vi) Overall, a) it was highlighted that for each type of dominant component market under externality neutrality assumptions there can be different types markets based on equality and freedom, from fully unsustainable ones, to dictatorship based ones, to liberalism based ones, and to true perfect market form ones; and b) it was mentioned that when markets under externality assumptions are placed under no externality neutrality assumptions, then suddenly, market growth is no longer limitless.

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